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**(54) ANTENNA DEVICE**

(57) Abstract:

**PROBLEM TO BE SOLVED:** To share three frequencies without inviting the increase in a large installation space by providing 2nd and 3rd beam forming means which respectively form beams of a frequency  $f_3$  in a horizontal direction which differs from the horizontal direction of main beams of frequencies  $f_1$  and  $f_2$  for 1st and 2nd linear arrays.

**SOLUTION:** Linear arrays 21 and 22 are installed perpendicularly to a ground surface, and the arrays 21 and 22 are arranged coaxially. Beam forming circuits 34 and 35 share the antenna openings of the arrays 21 and 22 and respectively form beams of a frequency  $f_1$  and a frequency  $f_2$  in the arrays 21 and 22, by feeding power sub arrays 31 and 32 mutually independently. Meanwhile, a beam-forming circuit 36 uses only the arrays 21 and forms beams of a

frequency  $f_3$  in the array 21. A beam-forming circuit 37 also separately uses only the array 22 and forms beams of frequency  $f_3$  independently of the beams of frequency  $f_3$  formed by the circuit 36.

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